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Influence of Sodium Dodecyl Sulfate on the Protolytic Properties of N,N-Dimethyl-N′-(2-Hydroxybenzyl) Ethylenediamine and Its Complexation with Copper(II)

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Abstract

To investigate the effect of sodium dodecyl sulfate (concentration Cs= 5 and 10 mM) on the acid-base properties of N,N-dimethyl-N′-(2-hydroxybenzyl) ethylenediamine and its complexation with copper(II) (Cs= 10 mM) was studied using the methods of potentiometry, spectrophotometry (at 298 K), and mathematical simulation of equilibria in solutions. The sodium dodecyl sulfate contributes to the formation of a monomeric form of N,N-dimethyl-N′-(2-hydroxybenzyl)ethylenediamine, while this compound exists in 40% isopropyl alcohol predominantly in the form of a dimer. The acidic properties of protonated monomeric and dimeric species are weaker than those in an aqueous alcohol solution. Sodium dodecyl sulfate facilitates the coordination of the deprotonated form of ligand. The region of the predominant accumulation of an uncharged complex of 1 : 2 composition is shifted to lower pH values (11.0 and 7.5, respectively), whereas the molar absorption coefficient of the complex increases by approximately 1.7 times. The apparent stability constants of complexes of the same type increase.

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